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ABSTRACT

The purpose of this document is to suggest ways in which teacher education in Florida could be changed in order to facilitate and promote the successful integration of academic and vocational education in schools throughout the state. The introduction includes a definition of the term "integration," a discussion of the assumptions underlying integration, and a rationale for integrating academic and vocational education. The following topics are discussed in a section on the basic approaches to implementing integration: reinforcing academics in vocational education, tying academics to real life and using applied learning, achieving vocational and academic teacher collaboration, using major projects and themes, and planning major restructuring of schools. The remainder of the document consists of a listing of 17 recommended changes in Florida's system of both pre- and inservice teacher education and discussions of each of the individual recommendations. The recommendations, which are discussed in the context of the overall problem of achieving integration and were developed on the basis of observations of numerous academic and vocational educators who were in the process of integrating their instruction. (Contains 16 references.) (MN)

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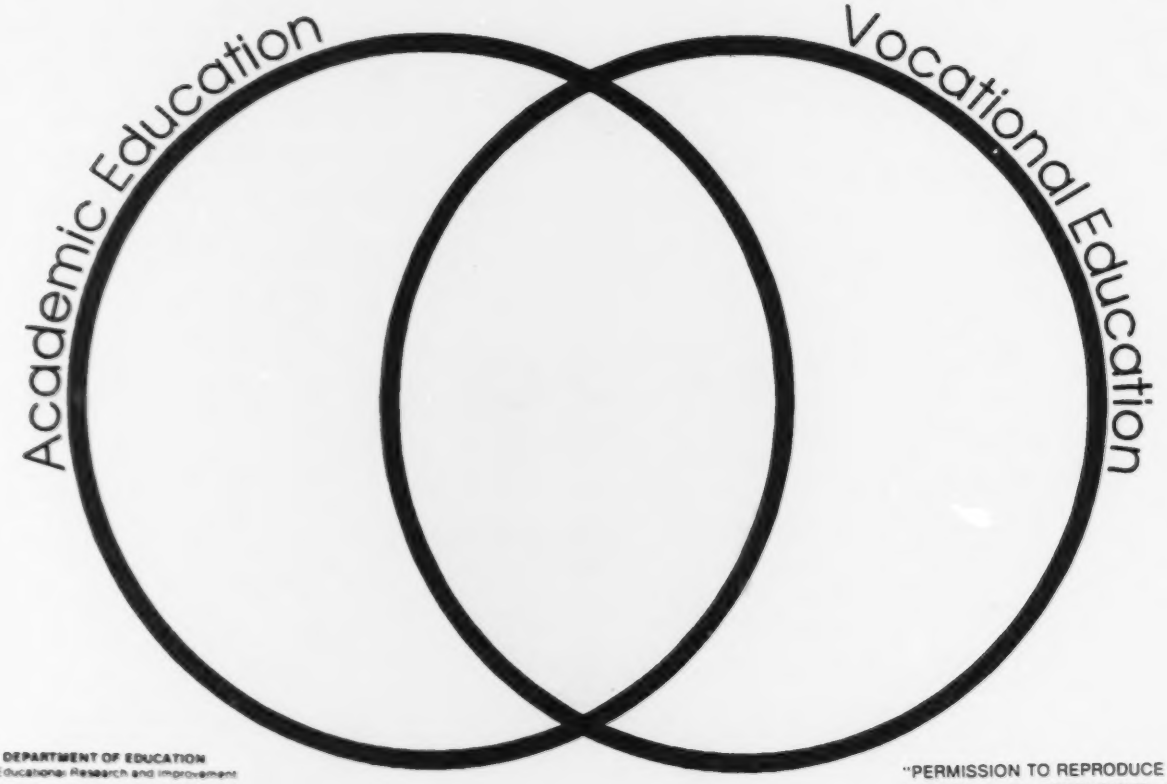
Integrating Academic and Vocational Education
Changes In Teacher Education
Fourth In A Series



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Several of the recommendations contained in this document may be somewhat controversial. The authors remind the reader that the opinions expressed herein represent those of the authors and are not necessarily the opinions of the DVACE, the DOE or the state of Florida. If these recommendations lead to constructive dialogue among the key stake holders in the integration movement and eventually lead to positive changes in teacher education that promote and facilitate the successful integration of academic and vocational education throughout our schools, then the purpose of this document will have been accomplished.

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Introduction

What Is Integration?

Assumptions Underlying Integration

Why Integrate Academic and Vocational Education?

Introduction

Before we look at the changes being recommended in teacher education to support the integration of academic and vocational education, it might be wise to provide the reader with an overview of the integration movement--what it is, what assumptions underlie it and the rational for integration. This should assist the reader who is involved in teacher education but who may not be as familiar with the integration movement to tie the two together before looking at the specific changes being recommended. The following section which provides an overview of the integration of academic and vocational education has been taken from the second document in a series of four related documents on integration developed under the direction of the Division of Vocational, Adult and Community Education; Florida Department of Education: ***Integrating Academic and Vocational Education -An Implementation Guide***.

Few movements in education have generated as much attention from such wide corners of the profession as the movement to ***integrate academic and vocational education***. Should academic and vocational education be integrated? Is an academic foundation or is vocational preparation more important for today's students or do they need both? John Gardner in a now-famous quote, makes the case for the importance of excellence in both academic **and** vocational education:

> We must learn to honor excellence...in every socially accepted human activity, however humble the activity and to scorn shoddiness, however exalted the activity...An excellent plumber is infinitely more admirable than an incompetent philosopher. The society which scorns excellence in plumbing because plumbing is a humble activity and tolerates shoddiness in philosophy because it is an exalted activity will have neither good plumbing nor good philosophy. Neither its pipes nor its theories will hold water. (Gardner cited in Hull & Parnell, 1991, p. 24)

The nationwide movement to bring vocational and academic education closer together has generated interest, concern and criticism from academic educators, vocational educators, policy makers, business and industry leaders, teacher educators, state department personnel, local school leaders, teachers and others. Supporters herald integration as the perfect vehicle to mend the historical rift between vocational and academic education while critics decry it as a movement

to make academics more "anti-intellectual" or to make vocational education more "academically elite". In reality, the integration of academic and vocational education is probably both of these--and more.

Even a casual observer of our modern high schools will notice the often vast separation between the vocational and academic programs, students and faculty. Rosenstock (1991) observes:

> One barrier to envisioning such an integration is the nearly total separation between academic and vocational education in today's high schools. Head and hand have never been farther apart. Vocational programs are often, literally and figuratively, in the basement of the school. They have become a "dumping ground," and both the students and the teachers in these programs have the lowest status in the school.
>
> Vocational students are relegated to "working with their hands," with minimal and diluted academic content, as the system fulfills its prophecy of their limited potential. Often their teachers come from different social strata than those who teach, for instance, American literature or physics. And students tend to flow or be directed toward teachers from similar backgrounds. Almost everyone understands the "class-sorting function" of vocational education. Although they would use different terms, even 14-year-olds understand it.
>
> Pursuing integration with academic education requires us to adopt a different view: that vocational education is a different way to learn the same academic concepts and skills that nonvocational students learn. Vocational teachers see students demonstrate competence, thinking ability, and creativity in a vocational setting that some of them are unable to demonstrate in an academic setting or on a standardized test.
>
> Some schools claim to have achieved such integration, but too often this means only that students are seen as vessels into which both academic and vocational content is tossed. A true integration requires nothing less than a full restructuring of high schools. (p. 435)

Several major reports promoting school reform have addressed the issue of integration. The authors of *The Unfinished Agenda* prepared by the National Commission on Secondary Vocational Education observed that as most commonly configured, both academic and vocational education courses are isolated, arbitrary and fragmented pieces of learning that do not offer students opportunities to make connections about the interrelatedness of ideas, the implications and application of knowledge, and the process of discovery. The report called for a joint effort of vocational and academic educators to bridge the gap between theoretical and practical education. The W. T. Grant Foundation concluded that a mixture of abstract and experiential learning opportunities, a combination of conceptual study with concrete applications and practical problem solving offers one of the most hopeful approaches to improving the education of 20 million young Americans who are not college bound (Adelman, 1989).

Gray (1991) states that blurring the distinctions between academic and vocational education is becoming the mission of vocational education. Unfortunately, he relates, when the concept is put into practice, it typically gets degraded to mean only that vocational education students should take more academic courses. The primary goal of integrating academic and vocational education, Gray suggests, is to make the experience of applied vocational education more accessible to academic students at the same time that advanced academic courses are made more accessible to vocational students. Mixing the two groups of students would have benefits for all such as reducing the stigma now associated with vocational education and eliminating the social isolation experienced by many vocational students. Gray goes on to say that integrating the two areas may have the greatest benefit for the brightest students by giving them access to sophisticated lab equipment that can help them explore math and science concepts.

Historically, vocational education became separated from academic education as vocational programs and courses expanded and grew in numbers and importance. This chasm widened as federal legislation such as the Smith Hughes Act of 1917 set aside federal funds specifically for vocational education. Establishing separate vocational and academic tracks in America's secondary schools became more widespread as our schools enrolled more and more students of lower socio-economic status, more immigrants and more minorities. The thinking was that education ought to be differentiated according to the "evident and probable destinies" of students. Those destined for working class jobs should be in vocational tracks, while those bound for managerial and professional positions should be in academic programs.

This separation of academic and vocational education has periodically come under intense scrutiny. Grubb et al. (1991) report that the first major review of vocational education--the Russell report of 1938--criticized vocational education for promoting a narrow conception of vocational education with overly specific training and for encouraging a dual structure segregating vocational from academic education. The Russell committee recommended that vocational education be made more general and flexible and that it become better connected to the academic curriculum. Later reports which led to the 1963 Vocational Education Act and the 1968 Amendments continued to criticize vocational education for its narrowness and job specificity and tried to make vocational education more general.

Although the integration movement is not new, it gained its most significant recent impetus with the passage of the Carl D. Perkins Vocational and Applied Technology Act of 1990. The act mandates that state and local agencies across the nation "integrate academic and vocational education in such programs through coherent sequences of courses, so that students achieve both academic and occupational competencies."

What Is Integration?

What is integrating academic and vocational education? Pritz (cited in Kolde, 1991) defines it as "the linking of academic skills instruction to vocational applications to enhance student learning" (p. 454). Norton et al. (1987) suggest that it means

> the idea of a pure liberal arts curriculum as a preparation for life may have been viable for the landed gentry of earlier centuries and for those today who wish to remain in an academic or pure research environment, but it is not generally viable today. It means that a general education curriculum, preparing a person neither for further education or the world of work, may, in the view of many people, never have been a viable option. And it means that the idea of a pure technical skills curriculum as a preparation for life in today's postindustrial information/service society is equally absurd. (p. 5)

The authors of this document offer an operational definition of the integration of academic and vocational education that, hopefully, will be helpful to academic and

vocational educators involved in implementing integration strategies. The integration of academic and vocational, we suggest, is:

> The modification of academic and vocational education philosophies, student outcomes, curriculum and instructional strategies aimed at making academic content job and life relevant and making academic learning activities more applied. It involves using vocational education settings to reinforce and apply academic skills and content. When integrated, academic education becomes more life relevant and career focused and more hands-on and vocational education becomes more academically rigorous and less narrowly focused on preparing students for specific jobs.

Let's look at some specific examples of what successful integration "looks like" in schools:

- A chemistry teacher at Southwest High School in Fort Worth, Texas turning traditional teaching methods "inside out" by having students work together to solve problems rather than spend most of their time listening to the teacher "teach". One of their major projects is to determine the most effective, economical and environmentally safe grass fertilizer for the front lawns of all 105 schools in the Fort Worth Independent School District (applied learning strategy and job relevance).

- Welding students at Crossland High School in Temple Hills, Maryland being taught how to write paragraphs in complete sentences about the planning, safety and procedural aspects of a major welding fabrication project and to how to make detailed mathematical calculations regarding materials and costs (vocational education reinforcing academics).

- A science teacher and a home economics teacher at Karns High School in Knoxville, Tennessee jointly teaching a course in "Nutrition Science" which includes the study of biochemical compounds, microbial changes in foods, global nutrition, and other science and foods concepts interwoven together (teacher collaboration).

- A physics teacher teaching the concept of momentum by having the class actually determine how many weights (mass) dropped from various heights (velocity) it takes to crush a certain number and type of aluminum can or cardboard structure rather than teaching the concept using the traditional

means of lecture, chalkboard, textbook readings and homework (applied learning strategy).

While these examples by no means cover the wide range of settings and strategies that can be used to integrate academic and vocational education, they do offer a glimpse of the kinds of things teachers can do to make ***academics more job relevant*** and to make ***vocational education reinforce academic skills***. Later sections of this document describe in some detail a variety of models, approaches, strategies and methods that can be used to implement the integration of academic and vocational education.

Assumptions Underlying Integration

The concept of integration is based on several important assumptions supported by recent research. These assumptions were well articulated by Sandra Pritz (1988):

1. Academic basic skills are imbedded in vocational tasks. Working together, vocational and academic teachers can identify exactly where academic concepts are covered in vocational courses in order to enhance them, highlight them and even award credit for them.

2. Vocational tasks provide for realistic use of academic basic skills. Often academic textbooks do not provide sufficient opportunities for students to practice such skills. Connecting academic learning with application strengthens students' understanding and builds the skills they need for solving problems and making decisions.

3. Neither academic basic skills nor vocational skills should be taught in isolation from each other. All teachers need to make students aware of the bonding between the two.

4. Differences in learning styles and teaching styles may have a significant impact on students' success in acquiring basic skills. If some students learn best through an abstract approach and others through concrete application, schools had better provide for both. (p. 18)

Another major assumption underlying the integration movement is that the "constructivist" view of learning is the most appropriate. There are two major aspects to the constructivist teaching philosophy (Duckworth, 1987). First, we should put students into direct contact with the phenomena or concepts to be learned--the **real thing**--not just books and lectures about them. Secondly, we should challenge students to try to explain the sense they are making, listen to them and try to understand their sense instead of explaining things to them. As students try to explain, they also begin to question and seek out more information to shed light on the subject in the process of constructing their own knowledge of the subject. These assumptions call for applied learning, discovery learning, introspection, reflective learning, and similar student centered approaches.

Why Integrate Academic and Vocational Education?

Certainly, making major changes in the way academic and vocational education are structured and delivered will require some major expenditures in terms of time, money, frustration and effort. Why do it? Why should academic and vocational education be brought closer together? Why should they be integrated? Although not all inclusive, following are some of the important reasons why integrating academic and vocational education is needed.

To Improve Basic Skills of Students

There have been numerous commissions, reports and studies recently that have documented the serious problem of students completing high school without mastering many of the workforce basics. Many students complete high school and some complete a vocational education program and still lack essential basic skills such as computing, writing, and problem solving.

One of the most recent and most comprehensive such reports is the SCANS report. The Executive Summary (SCANS, 1991) states the problem very well

> The message to us was universal: good jobs will increasingly depend on people who can put knowledge to work. What we found was disturbing: more than half our young people leave school without the knowledge or foundation required to find and hold a good job. These young people will pay a very high price. They face the bleak prospects of dead-end work interrupted only by periods of unemployment. (p. 1)

After surveying thousands of employers and workers all across the country, the SCANS Commission identified what they have called "Workplace Know-How". This know-how consists of basic, "foundation skills" in three areas and "workplace competencies" in five areas (SCANS, 1991):

Foundations Skills:

√ **Basic Skills**-reading, writing, arithmetic, math, speaking and listening.

√ **Thinking Skills**-ability to learn, reason, think, make decisions and solve problems.

√ **Personal Qualities**-individual responsibility, self-esteem, self management, sociability and integrity.

Workplace Competencies:

√ **Resources**-how to allocate time, money, materials, space and staff.

√ **Interpersonal Skills**-can work on teams, teach others, serve customers, lead, negotiate, and work well with people from culturally diverse backgrounds.

√ **Information**-can acquire and evaluate data, organize and maintain files, interpret and communicate, and use computers to process information.

√ **Systems**-understand social, organizational, and technological systems; can monitor and correct performance and can design or improve systems.

√ **Technology**-can select equipment and tools, apply technology to specific tasks, and maintain and troubleshoot equipment.

To help students attain this important workplace know-how, the SCANS Commission recommended that ***academic and vocational education be integrated.*** In the SCANS report entitled *Learning A Living: A Blueprint For High Performance*, the SCANS Commission (SCANS, 1992) reported

> Vocational education can shape itself into high-performance centers for training by incorporating the SCANS foundation skills into its curriculum. Reading, writing, math, and science are currently

> being woven into vocational studies to enhance the ability of students to achieve the SCANS workplace competencies.
>
> Recognizing the need to teach basic academic, thinking, and interpersonal skills, vocational education is also progressively becoming a team-teaching effort. Academic and vocational teachers work side by side to reinforce the relevance of academics by demonstrating how they apply to the high-performance workplace. (p. 37)

To Provide A Setting That Promotes Learning

In a recent report issued by the National Association of State Directors of Vocational Technical Education Consortium (no date), it was stated that

> Recognition is growing that the application-oriented setting of vocational programs can provide an avenue to basic academic skills acquisition, enhancement, and transference. As more is learned about the importance of learning styles in the acquisition of academic skills, there are implications for the way in which schools tend to be structured in favor of students with strong auditory and visual skills. If it is confirmed, as has been asserted, that learning styles of low-achieving students tend to be weak in the auditory and visual areas but high in the kinesthetic and tactile areas, then the hands-on participatory nature of instruction found in vocational classrooms will serve them well. (p. 4)

Dale Parnell (1991), a leader in the Tech Prep movement states that cognitive-learning research is discovering that intelligence and competence develop best out of interaction between obtaining knowledge and applying that knowledge and shatters long standing artificial distinctions between the two such as:

> * "head" work and "hand" work,
> * academic and vocational education,
> * knowing and doing,
> * education and training,
> * theoretical knowledge and applied knowledge. (p. 11)

Grubb et al. (1991) describe how integrating academic and vocational education can provide an applied setting which promotes learning.

> The voices of education critics have been joined by those of cognitive scientists, a loose network of psychologists, anthropologists, sociologists, and students of artificial intelligence. One conclusion from this emerging field is that knowledge (especially expert knowledge) is often specific to a particular activity or area of expertise, and that for most people effective learning requires a context that matters to them. In particular, most learning takes place in ways quite different from the form it takes in schools. (p. 83)

The work of Howard Gardner of Harvard University (1983) is gaining considerable attention by helping educators (particularly academic educators) focus on the notion that people have "multiple" intelligences--all equally valuable to us in our complex world. He dispels the myth that there is one central construct of human intelligence that can be measured by an intelligence test that should limit the degree to which students can succeed in school. Gardner suggests that a true human intelligence must measure up to a rigorous set of criteria such as physical isolation of that "ability" in the brain, the existence of prodigies or savants with that ability, an evolutionary history, a distinctive developmental history and several other criteria.

Using these criteria, Gardner has identified seven multiple human intelligences:

1. Linguistic
2. Logical-mathematical
3. Musical
4. Spatial
5. Bodily-kinesthetic
6. Interpersonal
7. Intrapersonal

Gardner suggests that each of these human intelligences is of equal value or worth. He adds that it is unfortunate that our schools, curricula, teaching methods and testing practices focus almost exclusively on the first two--linguistic and logical-mathematical--intelligences and virtually ignore the other five. These two intelligences, Gardner suggests, are far less important to most adults in the real world than they are to success in school. He proposes radically changing the school curriculum to engage as many of the human intelligences as possible. It takes little imagination to see that a fully integrated curriculum using applied learning strategies, hands-on, vocationally oriented learning activities and student

centered techniques like cooperative learning would engage a far wider range of human intelligences than is currently the case. Gardner is currently working with several schools to assist teachers in restructuring their curriculum and teaching methods so that all the human intelligences are engaged to some degree during the typical school day.

Adding to the mounting evidence than an integrated approach to curriculum promotes effective learning is the work of Caine and Caine (1991). They have extensively reviewed the literature regarding the link between integration and student learning. They make the following observations:

1. Effective learning is "brain-based" learning which means that teaching and learning are consistent with how the human brain learns most effectively and efficiently. Brain-based teaching acknowledges the brain's rules for how teaching and learning should happen.

2. The brain has an enormous innate capacity to deal with parts and wholes simultaneously. The brain can deal with the interconnected, interpenetrating, "holographic" world, **provided it is encouraged to do so**. One common element of effective methods is a sense of "embeddedness"--a sense of wholeness that emerges out of seeing how subjects relate to each other and how people relate to them. Integration of the curriculum is one approach to learning that is so powerful because it **orchestrates complex experience in a way that takes advantage of what the brain does well.** It does not limit the brain by teaching the memorization of isolated facts and details.

3. Brain research confirms that multiple complex and concrete experiences are essential for meaningful learning. This means using the brain's infinite capacity to make connections and understanding what conditions maximize this process.

4. The brain is a parallel processor and can be viewed as holographic, global or interconnected. The brain appears to have an innate ability to look for patterns.

5. Student learning style becomes less important the more we use brain-based learning. The more we approach meaningful, challenging, and relevant learning, the more likely that students of all types will learn well.

6. The brain processes parts and wholes simultaneously. People have enormous difficulty learning when either parts or wholes are overlooked.

To Refocus the Mission and Structure Of Our Schools

Virtually everyone agrees: our schools are not working very well--particularly our secondary schools. Students seem disinterested and bored, they drop out in unacceptably high numbers, too many students remaining in school just go through the motions often causing serious problems with crime and violence, employers lament their poor preparation and most students who do graduate and go on to college must engage in remedial activities to learn the basic skills they should have learned in high school. Parnell (1991) discusses five very important improvements that integration and similar initiatives can bring to our high schools and ultimately to our postsecondary institutions:

> Five substantial enemies stand in the way of excellence in the modern American school and college educational program.
>
> First, we have allowed the traditional college prep/baccalaureate degree curriculum to be the one and only definition of excellence in education.
>
> Second, in too many instances, we have allowed the curriculum to become disconnected from real-life issues. Teaching and learning in formal education usually takes place outside the context of real-life situations, activities, and problems. Studies have shown, however, that most individuals learn best when they are taught in a context of application.
>
> Third, scant attention has been given in education to the subject of continuity in learning. As a result, American schools and colleges have become a collection of disjointed courses that, more often than not, fail to connect with one another and with the students they want to teach.
>
> Fourth, little attention has been given, in defining educational excellence, to the pressing dilemma of how to meet the great range of individual difference among students.

> Fifth, we have allowed too many students--even those in so-called vocational education programs--to graduate from secondary schools and even postsecondary programs without the competencies required to secure entry-level employment in a rapidly changing environment, or the flexibility to retrain later as job-market requirements change. This group of students can be called "the neglected majority". (p. 3)

Some quotes from a recent ASCD *Curriculum Update* (Willis, 1992) that highlight the need to restructure our schools around an integrated curriculum include

> The trend toward interdisciplinary instruction is a great movement on many, many fronts, including colleges, national organizations, and state education departments. Across the country you'll see an incredible increase in the number of teachers who are bringing units of study together sensibly.
>
> The real world isn't divided into separate disciplines...children are interested in the entire world around them...it doesn't make sense to them to say "math" or "social studies". When instruction jumps from one discipline to another every 45 minutes, learning is fragmented unnecessarily...The disciplines are contrived ways to give people information...The world operates as a whole. In short, experts contend, the disciplines are artificial and they splice learning into fragments that may never cohere.
>
> The argument that teaching through the disciplines is efficient does not cut much ice with these experts. Efficiency is dependent on effectiveness...In discipline-based instruction, the teacher may very quickly get through material, but the kids may not have gotten anything out of it...the disciplines are an efficient vehicle for coverage--not learning. Although discipline-based instruction has enabled teachers to plow through lots of content, kids aren't coming out as competent human beings.
>
> A second major benefit of interdisciplinary instruction is its power to motivate students...Interdisciplinary themes and projects capture students' interest, increasing their level of concentration...Also motivating is the higher reality quotient of interdisciplinary studies...

> We have known for a long time that students learn more, remember more, and apply knowledge more when they are taught in an interdisciplinary mode...Students need to see the whole context of what they are learning...When they do, they thoroughly understand; they're not just doing rote memorization. Students' learning is richer when they are taught in an interdisciplinary mode because drawing connections between subjects requires students to do more higher-level thinking...You really have to understand things better to put them together... (pp. 2,3)

To Reduce The Tracking and Differentiation of Students

One of the serious problems arising from the separation of academic and vocational education in our schools has been the separation and tracking of students. Too often, better students are tracked into the college preparatory track, lowest ability students are tracked into vocational programs and the "forgotten majority" of students in between are funneled into a "general track" which does not lead to further education or to productive employment beyond high school.

There is substantial evidence that the tracking of students in this way reduces the performance of students in lower tracks and fails to improve the performance of those in upper tracks. One of the promises of the integration movement is to combine academics and vocational education and, therefore, combine students who would otherwise be separated into separate tracks--rarely interacting with one another either academically or socially.

Basic Approaches To Implementing Integration

Reinforcing Academics in Vocational Education

Tying Academics to Real Life and Using Applied Learning

Vocational and Academic Teacher Collaboration

Using Major Projects and Themes

Major Restructuring of Schools

Basic Approaches To Implementing Integration

There are as many ways to successfully integrate academic and vocational education as there are people doing it. This section describes several broad approaches or "models" that have been shown to be successful. Hopefully, these will serve as a framework within which you can implement your own specific strategies. Although much of the literature (and the related documents in this series on integration) often refer to eight models or approaches to integration, we have combined several similar or closely related models resulting in five models. This was done to help keep things as simple and straightforward as possible. Let's look at these five broad approaches that are being used to successfully integrate vocational and academic education:

Reinforcing Academics in Vocational Education

1.
Vocational education instructors teaching and reinforcing specific academic concepts and skills as they deliver instruction to students in their vocational classes.

This is one of the most fundamental and important approaches involved in successful integration. It involves vocational instructors making a concerted effort to reinforce academics as they prepare and deliver instruction in their vocational classrooms, shops and laboratories. This approach has proven to be highly effective because it provides relevance, meaning and practical application for the vocational student to learn and apply academic concepts and skills.

Too often, when academic concepts such as sentence structure, thermal expansion, chemical reactions, and converting fractions to decimals are taught as a part of academic courses students have little or no idea how these concepts can actually be used. When these academic concepts and skills are reinforced (or taught initially) in a vocational education setting students can see first hand the practical job related uses of the concepts. They can see that the concept of thermal expansion is critical to making a good weld and that sentence structure is essential to writing a technical report.

Tying Academics To Real Life and Using Applied Learning

2.

Academic teachers tying academic skills and concepts to current and future job and life roles of students and delivering instruction using more hands-on, applied learning techniques.

This is one of the most powerful strategies involved in integration. It addresses **what** is taught in academic classes and **how** it is taught. Often treated as two separate models in the literature, these two approaches go hand in hand so well, we have combined them into one. This model helps make learning interesting and motivating and helps to answer the very important question students constantly ask: "How am I ever going to use this?" Research (and common sense) suggest that one of the primary causes of poor school performance, lack of interest and motivation, absenteeism and dropping out is that many students see no real use for much of what they must learn in school. Learning how to conjugate verbs because the teacher says so or taking Algebra I simply because it's a prerequisite for Algebra II is not sufficient motivation for many students to want to put forth their best effort. Students want to know why they should learn what we have to teach.

The second part of this strategy has to do with **how** we actually deliver instruction in academic concepts and skills in schools. Far too often, we teach English, math, science and other academics using the four tried and true techniques: lecture to students, write stuff on the blackboard, have them read the textbook, and assign homework. Unfortunately, many students (and teachers) find this boring and simply tune out. Recent research suggests that for learning to be effective, we must engage learners psychologically, physically, socially and emotionally. In other words, we must engage the "total learner" in the learning process for learning to become interesting and effective. This requires the use of what has become known as "applied learning techniques".

Applied learning requires the instructor to **facilitate learning rather than to do all the teaching** and to provide appropriate, structured activities that **get the learner totally involved in applying, using and thus "owning" what was presented**. These concepts are certainly not new, however, recent research underscores the importance of using them and the integration of academic and vocational education now provides the perfect vehicle for using such techniques.

Applied learning involves having students engage in the same kinds of activities in school that they will be involved in when they are in the workplace. This involves working with others as a team or work group, solving real problems, creating products, completing projects and seeking answers to questions for which an answer does not yet exist.

Vocational and Academic Teacher Collaboration

3.

Vocational and academic teachers collaborating to jointly plan and deliver instruction, reinforce one another's content and sequence and link their instruction to emphasize the connectedness of academic and vocational education.

This important approach requires vocational and academic teachers to work closely together in concert to ensure that academic and vocational education are reinforcing and supporting one another. This requires academic and vocational teachers to break down the artificial barriers that often exist between the two. Academic teachers may find themselves visiting vocational teachers in a part of the building or campus they have never set foot in before. Vocational teachers may have to get over their feelings of inadequacy as compared to their academic counterparts and visit their classrooms as well.

Using Major Projects and Themes

4.

Use major projects and themes as a vehicle to integrate and apply learning from many disciplines or subject areas.

Using major projects and themes can be an exciting way to integrate not only academic and vocational education but also to integrate multiple academic subject areas. The project is more of a "how" and theme is more of a "what". Let's examine each. A major project is usually an assignment that requires individuals or groups of students to carry out multiple creative and problem solving activities and make decisions along the way toward creation of some finished product or

result. Projects usually span a number of weeks or months and often are worked on for part of the regular class period while the regular instructional program continues. The nature and scope of the project dictates the degree to which various vocational and academic competencies are put into practice as the project is executed. Major projects may be assigned by an academic teacher and worked on primarily in the academic classroom but may involve input by the vocational teacher and/or students or the reverse may be the case.

Let's look at an example to see how a major project might be used to integrate the curriculum. A fairly large scale project might be to have several students plan and execute an "experiment" over a six month period to reduce the amount of air pollution generated by the cars driven to school by faculty, staff and students. Activities they might engage in might be to research the whole area of automobile generated air pollution and determine how it is generated, the chemical processes involved, etc. and then by surveying the present driving habits of drivers, determine and graphically depict the estimated current level of pollution generated.

Next, they might research ways in which companies and municipalities and individuals have reduced pollution. They might then implement these strategies with faculty, staff and students. These might include organizing car pools, encouraging biking by students, performing a complete tune up on everyone's car and others. At the end of six months, students might then assess how drivers have changed any habits and estimate the reduction in pollution resulting from the tune-ups. Results could be written up in the form of newspaper articles, technical reports, graphs, charts, etc. using word processing and desktop publishing.

This hypothetical project involves concepts and skills from multiple areas including science, math, language arts, automotive technology, technology education, business education and others. Most importantly, it might provide a **vehicle** which can be used by academic and vocational teachers to make their instruction **real** and **applied** for students. They can see that what they are learning can being used today--not some time in the distant future.

Of course, projects can be of much smaller scale involving a single student or students in a single class. They might, however, involve the students from several classes such as horticulture and biology or physics and electronics or marketing and speech. Occasionally, an entire school may be involved in a massive project with each department, grade level or other cluster of students responsible for a specific portion of the project. Projects used for integration can be quite utilitarian

such as the carpentry program (with the assistance of the math class) designing and building playground equipment for a nearby elementary school.

Major Restructuring of Schools

5.

Restructuring courses, programs, departments or entire schools to promote the integration of academic and vocational education.

This approach occurs on a somewhat broader scale than the ones discussed previously, however, restructuring all or parts of entire schools has the potential for many important benefits. This restructuring may take several forms. Some of these include:

- Establishing one or more "academies" in a school which are really smaller schools within the school. An academy typically focuses on one broad occupational field (e.g., health occupations, agriculture, etc.) or less often on one area of student interest such as the performing arts, or the media. The idea is that academy students have their schedules blocked together so that they can attend vocational and most academic classes separate from students in the larger school. Several vocational and academic teachers are assigned to the academy and they teach all the students enrolled in the academy.

  For example, in a large secondary school of 2,000 students there may be a health sciences or health occupations academy enrolling, let's say, 150 students. These are students who have expressed an interest in pursuing health related careers and postsecondary education in the future. Some students may go to work right after high school, many will pursue an associate degree or technical certificate in one of many allied health fields while a few others may go on to four-year universities and major in health related fields. A few may go on to become physicians, nurses and other medical professionals.

  Although many academies are aimed at keeping the potential drop out in school by making instruction immediately relevant to the student's career interests, all academies are not limited to this function. There are high schools organized around a number of academies and all students in the

school are enrolled in one of the academies. Often, additional funding is needed to organize effective academies. Additional funds are needed to reduce class size, provide initial teacher training, fund ongoing teacher planning time and related costs.

Academies have several important advantages including having a smaller number of teachers interact with students over their high school years, establishment of a greater sense of belonging and community due to the smaller school within a school, and the establishment of linkages with employers in the area of the academy. Establishing one or more academies requires some major commitments on the part of school boards and principals, however, the results can be very positive.

- Establishing "magnet" schools. Similar to the academy, a magnet school focuses on a single occupational field. There are magnet schools devoted to aviation, electronics, agricultural science and other areas. These magnet schools can usually be attended by any student in the school district on a first come first serve basis. One potential problem with magnet schools open to any student from throughout the school district is transportation.

- Establishing occupational clusters within high schools. In this approach, there are several occupational clusters around which all instruction is organized. Clusters might be agribusiness, industry, public service, health sciences and business. There are usually no traditional academic departments such as English, math or science nor are there narrowly focused vocational programs such as automotive mechanics, secretarial studies, etc. Academic teachers are attached to an occupational cluster and students pursuing that cluster take the academic courses identified as most relevant for that particular cluster.

The five approaches described in this section represent the basic framework that might be used to integrate academic and vocational education. Let's now look at several changes recommended for teacher education for the integration of academic and vocational education in our schools to become a reality.

Changes In Teacher Education

The following are recommended changes in the teacher education system and its context offered by the authors based on their experience working with many academic and vocational educators who are in the process of integrating their instruction. These recommendations are based on the assumptions that teachers (next to students) are the primary ingredient in the educational process and that if current and future teachers are expected to teach fundamentally different than teachers do today, then teacher education must undergo fundamental change as well.

We suggest that decision makers in the Department of Education, Colleges of Education, universities, school districts, community colleges, and schools throughout Florida give serious consideration to making major, structural, programmatic changes including but not limited to the following:

1. ***Recognize that teacher education can be a positive force in fostering major changes in our educational system--including integrating academic and vocational education.***

This first recommendation has more to do with the context in which teacher education operates rather than with specific changes in the teacher education process or product. It is perhaps the easiest of the recommended changes to carry out yet it is also probably the most fundamental of the changes offered in this document. It does not involve any new funding, requires no changes in rules or regulations and would not necessitate any alterations in the educational infrastructure. Rather, if implemented, it would simply require that decision and policy makers in the legislature, the Florida Department of Education and other governmental bodies more fully recognize that teacher education can be a major force in bringing about change in Florida's schools.

It should be recognized--particularly by the Department of Education--that the state's college and university based teacher education programs--both private and public--are a legitimate player and stake holder in major educational reform, including the integration of academic and vocational education. Many teacher educators have made it their life's work to stay in close touch with the very latest in educational research and best professional practice. Many teacher educators are, themselves, actively

engaged in conducting research into improving the teaching/learning process and are also linked with a vast network of teacher education institutions throughout the country and internationally. This expertise, commitment and up-to-date knowledge, many perceive, is vastly underutilized in terms of driving educational change in this state.

Acknowledging that the state's network of teacher education institutions and teacher educators are full partners in educational improvement in Florida could be manifested by changes as simple as inviting teacher educators (particularly vocational teacher educators) to all Tech Prep, Blueprint and related meetings or as major as consulting teacher education institutions for their formal, early input on contemplated changes and new initiatives such as Blueprint 2000 or major changes in teacher certification.

The fact that teacher education is often "on the outside looking in" in terms of educational improvement and reform in Florida does little to foster a positive, collaborative relationship between teacher educators and decision makers in Tallahassee. Many teacher educators find that they must rely on their contacts in school districts and community colleges and on teachers enrolled in their courses as their primary source of information on what is taking place in terms of major initiatives and changes in the state's educational system. Recognizing that teacher education is a full partner, involving teacher education substantively and early in reform initiatives and then building teacher educators into the information loop would yield significant dividends in bringing the considerable impact of teacher educators to bear on bringing about positive changes in our schools.

2. ***Proven integration strategies such as cooperative learning, team teaching and active learning should be extensively modeled by teacher educators in preservice teacher education courses and experiences.***

It is widely accepted that teachers tend to teach as they are taught. If this is the case, having preservice teachers actually experience effective integration strategies in their preservice university teacher education courses and related experiences may be a very effective means of insuring

that new teachers enter the profession equipped to successfully integrate their instruction. Once appropriate curricular and structural changes were made in university teacher education programs and courses to more fully model integration strategies and approaches, there would be little additional cost involved.

If teachers in training--both academic and vocational--actually experienced teaching methods like cooperative learning, teaching of critical thinking skills, active and applied learning, and others, they would be more apt to use those strategies during their internships and during their teaching careers. This tendency would probably be reinforced even greater if these preservice experiences were very positive and successful. Professors delivering professional education courses in methods, curriculum, measurement, foundations and other areas should be prepared and encouraged to successfully model a wide range of integration strategies and techniques in their classes.

In addition, professors outside of Colleges of Education teaching subject matter courses to future academic teachers such as math, science and English should be trained in and encouraged to use applied learning and similar integration techniques in their classes. It is not reasonable to expect math and science teachers to embrace active and applied learning strategies and to successfully tie academic skills to the world of work when they have been exposed (both during their own high school days and during their community college and university preparation) to the teaching of math and science in an abstract, disconnected, theoretical manner by their teachers and professors.

Persuading college and university professors to fully embrace the integration philosophy and to successfully model applied learning and related integration strategies would be no small undertaking but could be done. It would take some involvement by Deans of Colleges of Education and their counterparts in other colleges on campus, by chairs in vocational and academic teacher education departments, by Department of Education personnel and others.
It would also probably require funded pilot projects to develop the research base, course materials and to conduct the necessary inservicing of professors.

Successfully modeling integration strategies and materials in preservice teacher education courses is, perhaps, one of the most productive changes that could be made in teacher education to promote the integration of academic and vocational education. Such a change would impact virtually every future teacher in the state in all subject areas and at all levels. It would also greatly relieve the burden currently falling on districts and the Department of Education to provide inservice to teachers who were not originally trained in integration strategies. With this recommended change implemented, teachers--both academic and vocational--would enter the teaching profession embracing the integration philosophy and trained in the methods and materials needed to implement it.

3. ***Bring about major change in teacher education to integrate academic and vocational education the same way major change has been brought about in school districts and in community colleges in this state: provide additional funding.***

Perhaps, the most effective way to rapidly promote the infusion of integration strategies into teacher education programs and courses is to use the same approach that has proven very successful in promoting integration in school districts and community colleges, that is, providing financial support and incentives to develop and implement these approaches. It should be recognized that the dramatic and rapid changes in education brought about by recent integration initiatives such as SREB, the Blueprint For Career Preparation and Tech Prep have all been externally funded initiatives. Very few, if any, schools or districts have undertaken such projects without major funding provided for that purpose.

It would not be hard to imagine how extensively the state's educational system would have changed if school districts and community colleges had been "invited" or even "challenged" to implement Tech Prep or the Blueprint without funding incentives attached. Similarly, it will be interesting to see what degree these innovations remain when funding is no longer available. It seems reasonable, then, that to expect dramatic changes in teacher education, external funding is needed.

Colleges of education and universities are saddled with the same operational constraints that districts and community colleges are that inhibit change. This includes inertia, natural resistance to change, bureaucracy, outdated regulations, and a host of others. It must be recognized that those involved in potentially changing the teacher education system all currently have full time jobs which consume all their available time and energy. Funding would provide relief from regular teaching or administrative responsibilities or make employing additional personnel possible so new integrated teacher education programs and courses can be conceptualized, designed, developed, tried out, refined and replicated. Additional funding has a strange way of loosening up the system and letting change happen.

It is suggested that several pilot projects be funded as soon as possible in the state's Colleges of Education to restructure teacher education programs to promote integration. New courses are needed, new approaches are required, additional materials are essential and rules and regulations have to be changed. All this will take additional time and effort which is exactly what teacher education personnel currently have little of.

4. ***A pilot integrated academic/vocational teacher education program should be funded immediately within one of the state's Colleges of Education.***

One of the most effective change strategies would be to fund pilot efforts in hopes that these will be successful and then replicated elsewhere. This is the approach that has been taken with other integration initiatives in Florida including Blueprint and Tech Prep. The same approach is suggested with promoting change in the state's teacher education programs. One or more pilot integration teacher education programs should be funded during the next two or three years. One approach would be to fund two separate pilots with the idea that the most successful of the two might become the model for the other state universities or the best aspects of both pilots might be merged into one.

Such a pilot integrated teacher education effort might focus on :

* Identifying similar projects and materials from across the country.
* Altering the traditional College of Education departmental governance structure to better promote integration.
* Identifying specific changes that need to be made in teacher certification requirements to facilitate integration.
* Working with other colleges (Arts and Sciences, Business, etc.) on campus which teach subject matter courses to incorporate integration strategies.
* Realigning courses and course credits to foster integration.
* Developing new and revised integrated courses and related experiences.
* Developing integrated internship experiences.
* Developing integrated teacher education materials.
* Pilot testing the program and making necessary revisions.
* Assisting other universities in adapting and adopting the new program.

This recommendation would probably involve the greatest amount of funding of any of the recommendations described in this document, however, such an undertaking is essential if the state is serious about preparing new teachers who can "hit the ground running" in terms of integration.

5. ***Move away from so many subject and grade level specific professional education course requirements for teacher certification and move toward more integrated requirements.***

One major change that might be made in preservice programs and courses includes reducing the number of specialized or subject matter specific professional education courses such as methods and curriculum. For example, presently there are separate methods and related professional courses required for preservice teachers in science education, math education, business education, technology education, etc. If preservice teachers took fewer subject matter and grade level specific professional education courses and more broad based or generic courses, they would be encouraged to teach across the curriculum and collaborate with teachers in other subject areas. For this major structural change to take place, however, teacher educators and College of Education deans would have to embrace the integration philosophy whole heartedly and state teacher certification requirements would have to be radically altered. Neither of which is a small undertaking.

An interim approach might be to identify multiple methods and other professional education courses that would meet the requirements for certification in a specific subject area and/or grade level. For example, a special methods of teaching secondary science and a special methods of teaching technology education might be used interchangeably for both science education and technology education majors. Science education and technology education majors could be combined into one special methods class which might be team taught by a science education and a technology education professor. Special methods of teaching agriculture and special methods of teaching industrial, for example, might also be used interchangeably.

Eventually, several broad categories of professional courses might be developed rather than the current reliance on so many subject matter specific courses. For example, a "Methods of Teaching Analytical Content" might be required for teachers in highly structured, analytical subjects like technology education, math education, business education, etc. while a "Methods of Teaching Creative Subjects" course might be used to

prepare teachers in English education, Marketing education, and theater education.

6. ***Have an integrated team of academic and vocational teacher educators provide preservice teacher education coursework for a cadre of vocational and academic preservice teachers and then provide support during their first several years in the profession.***

Such a model would provide several very important ingredients which are now lacking in the state's teacher education programs. First, this cadre of teachers would be exposed to both academic and vocational teacher educators. By interacting with both over an extended period of time, they would be exposed to both the complementary and yet competing missions and requirements of academic and vocational education. By providing this balance, new teachers would be able to develop a more balanced personal philosophy of education. This should help reduce the mistrust and lack of appreciation some academic and vocational teachers have for one another.

Another thing this model would accomplish would be to provide a vehicle for prospective vocational and academic teachers to go through their teacher education experiences side by side. When completing and entering the profession, they would be much more inclined to work closely with their academic or vocational counterpart whichever the case may be.

Finally, such a model would provide for much needed continuity in the teacher education experience. If a team of vocational and academic teacher educators worked closely with a cadre of preservice teachers over a two year period and followed them up during their first two years on the job, there would be ample time to develop rich relationships and support one another's mutual growth and development--particularly across disciplinary lines.

7. ***Restructure Colleges of Education to eliminate separate departments for "Vocational Education" and for academic programs such as "Secondary Education".***

This somewhat radical change might contribute greatly to the breaking down of some of the artificial barriers between vocational and academic education. If the removal of barriers between vocational and academic education in our public schools is a worthwhile goal, then so might it be for our Colleges of Education. If carried out, however, it should be done in a manner that avoids the appearance of one department "swallowing" up another but, rather, two units merging to become one.

Of course, many of the advantages resulting from merging the two department into one can still be accomplished if the vocational education and the academic education units remain administratively separate but work together to integrate the experiences their respective teacher education majors receive. It should be recognized, however, that in most universities, the "department" is the major unit of accountability from a fiscal standpoint and, therefore, if vocational and academic teachers are trained in separate departments, the issue of "turf' and "our FTE vs. your FTE" cannot be avoided. When housed in a single fiscally accountable unit such as a merged department, academic and vocational teacher education students, courses and professors can reconfigured in virtually any pattern without affecting the department's FTE productivity.

8. ***Combine academic and vocational education student teachers for a common "Senior Seminar" or other similar culminating experiences.***

In most teacher education programs, the culminating experience is an internship completed in an actual teaching situation in a school or schools. This internship is usually accompanied by a seminar of some sort in which interns talk about common problems and issues. Most often, the English education majors attend one seminar, the science education majors another and in the vocational education side of the house, agriculture education

majors attend their seminar while their Health Occupations or Home Economics counterparts attend theirs.

There is much merit to combining interns across subject area lines for these very valuable seminar experiences. It would provide a means for academic teachers in the various disciplines, vocational teachers in the several vocational program areas and for academic and vocational teachers to interact with and to come to a better appreciation and understanding of one another. Waiting for that collegiality to occur until after they graduate and enter the teaching profession may be too late. Once employed as full time teachers, they become almost totally consumed by keeping their heads above water and they have little time or energy to interact regularly with their counterparts across the hall or across campus.

A very practical suggestion for accomplishing this integrated seminar would be to group interns by school or location rather than by academic or vocational discipline. For example, rather than getting all the Middle School interns in a district together for a separate seminar and all the vocational teachers together for theirs, it would be more efficient for the interns and for their university supervisors to cluster them by school or nearby schools. In this approach, all the interns in a large secondary school, for example, would meet together for their integrated seminar--regardless of subject area. This would result in much less travel time and far greater interaction across subject area lines.

9. Provide pre-internship and partial internship experiences for student teacher in disciplines other than their own.

One approach to exposing vocational and academic teaches to each other's subject area and students is for them to complete a pre-internship or partial internship in each other's area. Perhaps, there is no better way for an academic teacher to see how vocational education can reinforce the academic skills they are trying to teach than for the future academic teacher to spend several days, weeks or months in one or more vocational classrooms and laboratories observing, interacting with students and even doing some teaching.

It might also be equally valuable for future vocational education teachers to spend some time as an intern or pre-intern in several academic classrooms. They could gain first hand knowledge of how as a future vocational instructor they might collaborate with their academic counterparts and provide the practical application for academic skills and concepts that students so desperately need.

10. Place interns in schools with carefully selected supervising teachers who are successfully integrating academic and vocational education.

There is considerable evidence that the local classroom teacher under whose supervision an intern completes the student teaching experience has a considerable influence on the philosophy and approach to teaching adopted by the intern. This presents a marvelous opportunity to provide some valuable exposure to integration strategies and techniques in the actual classroom and/or laboratory with real students. If the student teacher completes the internship under the supervision of a teacher who is actively and successfully engaged in integration activities, the intern will have an opportunity for hands-on experience with integrating his or her subject matter.

11. To be able to effectively relate their instruction to the future work lives of their students, teachers should have as much previous work experience in the private sector as possible .

This is especially applicable to academic teachers. If an academic teacher goes through public school, graduates, enters the university, completes a teacher education program, and begins teaching, he or she is greatly handicapped in being to relate the academic subject being taught to the larger world of work. There is a large percentage of academic teachers who have very limited work experience in the kinds of jobs and careers that their students will ultimately be employed in. It is difficult, for

example, for an algebra teacher to relate the solving of equations for an unknown quantity to the world of work if he or she has really never been there.

The "ideal" academic teacher would be someone who not only has extensive mastery of their academic discipline but who can also help students see the connections between the academic skills and concepts being taught and students' immediate and future lives as workers, parents, spouses, citizens and consumers. It is no longer enough to tell students they need to learn specific academic content because they will need it for the next course or need it for the next level of education--many students will not be around for the next course or level if they fail to see the relevance, meaning and real life connection of what they are being asked to learn. A teacher--academic or vocational--who can't adequately answer the question, "How am I ever going to use this?" is not going to be able to reach an increasing number of today's students.

One way to ensure that academic teachers have experience in the private sector is to seek prospective teachers with extensive work experience in as many fields as possible. Another is to provide an opportunity for academic teachers to become more familiar with how their academic content is being used in the work of work. This can be accomplished by arranging for employment in the private sector during the summer months, job shadowing, industry internships, and attendance at industry sponsored workshops and seminars. Another strategy that is low cost and hassle free would be for academic teachers (including elementary and middle school teachers) to rotate through various vocational-technical education programs during the summer months at a nearby postsecondary technical center, secondary school or community college. This would also provide the added advantage of building linkages between the academic teacher and vocational instructors.

The need to have previous work experience in the private sector also applies to vocational education teachers. Teachers in some vocational program areas such as Business Education, Home Economics, Agriculture, and Marketing can teach without having any private sector experience. This is particularly troubling to some vocational educators in light of the employment related mission of vocational education. Teachers in these vocational programs would be better equipped to reinforce the need for academic concepts and skills on the job (as well as their own vocational

program competencies) if they had job experience in the field and could relate realistic, relevant examples of how academic skills are actually used. It might be worthwhile to attempt some of the same strategies mentioned earlier for academic teachers to provide an opportunity for vocational teachers to gain, broaden or update their occupational experience.

12. Elementary and middle school teachers should be better equipped to relate their subject matter to the world of work.

Like the secondary teacher described above, many elementary and middle school teachers lack work experience in the private sector. In addition to the suggestions described above that might give such teachers an opportunity to gain relevant work experience, other strategies might prove useful. One recommendation for assisting elementary and middle school teachers to tie their academic skills and concepts to the world of work would be to provide an opportunity for them to explore a wide variety of jobs and occupations using work and job samples.

By experiencing a wide variety of work and job samples, teachers would be better able to see specifically, how the academic content they teach is actually used in many jobs and occupations. For example, struggling through the process of measuring, cutting, bending and joining PVC pipe (a job sample), an elementary teacher might see marvelous examples of occupational use for the skills of measuring, counting, etc. Such activities might be accomplished in a Vocational Evaluation laboratory of which there are many throughout Florida. Vocational Evaluators can also provide academic teachers with much work related knowledge in the areas of career maturity, use of the Dictionary of Occupational Titles, interest and aptitude batteries, etc.

13. Strategies are needed to insure that vocational teachers--particularly non-degree teachers--possess the necessary academic skills that should be reinforced in their vocational instruction.

Just as academic teachers will have difficulty tying their instruction to the world of work if they haven't been there, vocational instructors will be hard pressed to reinforce academic skills they have not mastered themselves. Efforts should be made to insure that vocational teachers possess the important academic skills, concepts and knowledge that they will be called upon to reinforce when integrating academic and vocational education. This is especially true for the non-degree vocational teacher who may be highly skilled in the occupational field but who may be somewhat weak in certain academic skills.

Vocational teachers teaching in programs such as Business Education and Technology Education must meet all the academic requirements as their academic teacher counterparts including completing university and College of Education admission and exit requirements such as the ACT, the CLAST and other requirements. Teachers in non-degree programs such as Industrial, Health Occupations, and Public Service, on the other hand, may receive a district based teaching certificate by completing four university courses or completing a district based training program. Some of these teachers may need additional assistance in strengthening basic academic skills they may lack or be weak in.

A more radical solution would be to require all vocational education teachers--regardless of program area or level--to possess a Bachelors Degree just like any academic teacher does. This approach, some feel, although controversial, is needed to give vocational education the needed credibility for academic teachers to view vocational education as an equal partner in the holistic education of students.

14. Training in academic/vocational integration philosophies and strategies should be made available to key players in the preservice teacher education system.

The literature supports the notion that we cannot embrace a change that we do not have much knowledge of. Teachers, students and employers may be very supportive of the integration of vocational and academic education, yet, if other key players in our educational system are not fully aware of the need for and advantages of integration, progress will be hampered.

Some of the key stake holders who might benefit from intensive training in what integration is all about, why it is needed and how to fully integrate academic and vocational education include:

* Key Department of Education personnel--particularly in the Division of Vocational, Adult and Community Education, the Division of Public Schools and the Teacher Certification Section.
* Key members of the Legislature including aides and staff members.
* District superintendents and Assistant/Associate Superintendents with direct responsibility for academic and vocational instruction.
* Members of school boards in Florida's 67 school districts.
* Occupational deans in community colleges.
* Deans and Associate Deans in Colleges of Education; Provosts and Academic Vice Presidents in universities.
* Principals and assistant principals in high schools, middle schools and elementary schools.
* Guidance personnel at all levels.

- College of Education faculty--particularly in secondary education, middle school, vocational education, counselor education, and special education.

Such inservicing of key leaders and decision makers in our education system is critical to get the integration movement more widely accepted and to insure that progress in implementation is sustained.

15. ***Added to Florida's essential teaching competencies should be the integration of vocational and academic education, the use of applied learning and tying content to the immediate and future lives of students.***

We cannot ignore the reality that teacher education and certification in Florida are largely driven by state mandated rules and regulations rather than by research or best professional practice. One way, then, to infuse integration into the teacher education infrastructure is to mandate it by including one or more competencies dealing with integration to the list of state mandated competencies to be attained by all teachers. Although many educators highly resent the relentless stream of mandates and directives, they do serve to get people's attention and they do drive program and funding decisions.

16. ***Require all new school principals and local directors of vocational education to receive formal training in the rational for, philosophy of and strategies for integrating academic and vocational education.***

Many would agree that the most important person in promoting change in a school is the building level administrator. He or she communicates the mood and mission of the institution to the faculty and staff. The principal or director of a school can greatly facilitate the adoption of changes he or she agrees with while often dooming initiatives they don't buy into to failure with benign neglect (or worse). To ensure that principals (and

related administrators) fully understand the integration movement and its vast potential for improving both academic and vocational education, it is recommended that they be required to undergo some degree of formal training in integration.

17. Require all current vocational and academic teachers to complete an inservice component or course on integration to renew their teaching certificate.

In an effort to increase Florida teachers' ability to assist their students in improving their reading ability and to increase teachers' computer skills, these two areas over the years became important parts of renewing a Florida teaching certificate. Similar importance should be placed on the integration of vocational and academic education at all levels. Probably the most effective means of reaching the thousands of teachers already teaching in Florida's schools is to require an integration component for certificate renewal.

Although such a move might be viewed as "heavy handed" by some teachers, it would be effective in providing all current teachers with some exposure to integration during the ensuing five years or so. The state should be extremely cautious, however, to avoid the situation experienced recently with the requirement for ESOL training where the requirement was not matched with adequate capability for meeting the requirement. If an inservice course or component is to be required for certificate renewal, the state should gear up to provide accessible and high quality training.

Concluding Remarks

The forgoing represents only some of the possible changes that might be made in teacher education in Florida to promote the successful integration of vocational and academic education in our classrooms, shops and labs. The burden of making some of these changes would fall on the shoulders of individuals responsible for the state's Colleges of Education and universities. Other changes can only be made by professors teaching in the various teacher education programs. Other changes would have to be instituted by officials within the Florida Department of Education. Finally,

some of these suggestions would require changes on the part of local schools and school districts.

Some of the recommendations presented in this document can be made relatively easily while others would require changes in State Board of Education Rules or even legislative action. Some recommended changes could be effected rather quickly while others might require months or years to accomplish. Hopefully, most of these ideas, if implemented in some form or another, would have a positive impact on the removal of the artificial barriers between the "education" and the "training" of students. Whether any of the changes included in this report are eventually implemented really depends on the merit of each recommendation and the degree to which those who have the power to effect change are committed to doing so.

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